

FIG. 1

- (160) SPEED CONTROLLER
- (110) HIGH FREQUENCY GENERATOR AND MAGNETIC FLUX
REGULATOR
- (170) CURRENT CONTROLLER
- (180) FREQUENCY REMOVER
- (120) MAGNETIC FLUX OBSERVER
- (130) HIGH FREQUENCY COMPONENT EXTRACTOR
- (136) INITIAL MAGNETIC POLE POSITION ESTIMATOR
- (190) COORDINATE TRANSFORMER
- (191) COORDINATE TRANSFORMER
- (135) ROTOR POSITION ESTIMATOR
- (140) HYBRID DEVICE
- (102) VOLTAGE TYPE INVERTER
- (150) SPEED ESTIMATOR
- (101) AC MOTOR

FIG. 2

- (211) SIGNAL ATTENUATOR
- (212) SIGNAL ATTENUATOR
- (230) SUPERPOSED FREQUENCY COMPONENT REMOVER
- (223) MAGNETIC FLUX QUANTITY CALCULATOR
- (224) MAGNETIC FLUX POSITION CALCULATOR

FIG. 3

- (130) HIGH FREQUENCY COMPONENT EXTRACTOR
- (310) SUPERPOSED FREQUENCY COMPONENT EXTRACTING UNIT
- (311) COORDINATE TRANSFORMER
- (312) BAND-PASS FILTER
- (320) MAGNETIC FLUX POSITION ERROR SIGNAL CALCULATING
UNIT
- (321) SERIAL PARALLEL CONVERTING UNIT
- (322) AMPLITUDE CALCULATOR
- (323) AMPLITUDE CALCULATOR

FIG. 4

- (410) HYBRID DEVICE
- (432) SIGNAL ATTENUATOR
- (450) SPEED ESTIMATOR

FIG. 5

- (556) SERIAL PARALLEL CONVERTING UNIT
- (510) MAPPING TABLE
- (520) MAPPING TABLE
- (560) MAPPING TABLE
- (515) PARALLEL SERIAL CONVERTING UNIT

FIG. 8

- (860) SPEED CONTROLLER
- (810) HIGH FREQUENCY GENERATOR AND MAGNETIC FLUX
REGULATOR
- (870) CURRENT CONTROLLER
- (820) MAGNETIC FLUX OBSERVER
- (830) HIGH FREQUENCY COMPONENT EXTRACTOR
- (835) INITIAL MAGNETIC POLE POSITION ESTIMATOR
- (890) COORDINATE TRANSFORMER
- (891) COORDINATE TRANSFORMER
- (802) VOLTAGE TYPE INVERTER
- (801) AC MOTOR
- (850) SPEED ESTIMATOR
- ROTOR POSITION ESTIMATOR
- HYBRID DEVICE

FIG. 9

- (910) SUPERPOSED FREQUENCY COMPONENT EXTRACTING UNIT
- (911) COORDINATE TRANSFORMER
- (912) BAND-PASS FILTER
- (920) MAGNETIC FLUX POSITION ERROR SIGNAL CALCULATING
UNIT
- (921) SERIAL PARALLEL CONVERTING UNIT
- (922) AMPLITUDE CALCULATOR

(921) AMPLITUDE CALCULATOR

FIG. 10

(996) SERIAL PARALLEL CONVERTING UNIT
(950) MAPPING TABLE
(970) MAPPING TABLE
(975) MAPPING TABLE
(965) PARALLEL SERIAL CONVERTING UNIT

FIG. 11

① A REGION : TRACK OF DOUBLE HARMONIC OBTAINED WHEN
HIGH FREQUENCY SIGNAL IS SUPERPOSED IN DIRECTION OF
D-AXIS
② B REGION : TRACK OF DOUBLE HARMONIC OBTAINED WHEN
HIGH FREQUENCY SIGNAL IS SUPERPOSED IN DIRECTION OF -D
AXIS

FIG. 12

SERIAL PARALLEL CONVERTING UNIT

FIG. 13

(160) SPEED CONTROLLER
(110) HIGH FREQUENCY GENERATOR AND MAGNETIC FLUX
REGULATOR
(170) CURRENT CONTROLLER
(180) FREQUENCY REMOVER
(120) MAGNETIC FLUX OBSERVER
(130) HIGH FREQUENCY COMPONENT EXTRACTOR
(190) COORDINATE TRANSFORMER
(191) COORDINATE TRANSFORMER
(140) HYBRID DEVICE
(102) VOLTAGE TYPE INVERTER
(150) SPEED ESTIMATOR
(101) AC MOTOR

FIG. 14

- (230) SUPERPOSED FREQUENCY COMPONENT REMOVER
- (233) SIGNAL ATTENUATOR
- (234) SIGNAL ATTENUATOR
- (223) MAGNETIC FLUX QUANTITY CALCULATOR
- (222) MAGNETIC FLUX POSITION CALCULATOR

FIG. 15

- (432) SIGNAL ATTENUATOR

FIG. 16

- (556) SERIAL PARALLEL CONVERTING UNIT
- (520) DEPENDING ON MECHANICAL CHARACTERISTIC
- (515) PARALLEL SERIAL CONVERTING UNIT

FIG. 17

- (860) SPEED CONTROLLER
- (810) HIGH FREQUENCY GENERATOR AND MAGNETIC FLUX
REGULATOR
- (870) CURRENT CONTROLLER
- (820) MAGNETIC FLUX OBSERVER
- (830) HIGH FREQUENCY COMPONENT EXTRACTOR
- (890) COORDINATE TRANSFORMER
- (891) COORDINATE TRANSFORMER
- (840) HYBRID DEVICE
- (802) VOLTAGE TYPE INVERTER
- (850) SPEED ESTIMATOR
- (801) AC MOTOR

FIG. 18

- (996) SERIAL PARALLEL CONVERTING UNIT
- (970) DEPENDING ON MECHANICAL CHARACTERISTIC
- (965) PARALLEL SERIAL CONVERTING UNIT